Climate Physics and Chemistry

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Course website:
https://www.pku-atmos-acm.org/acmCourse.php/#Climate



北京大學
PEKING UNIVERSITY

Goals

- **Introduce basic scientific knowledge about climate and climate change**
- **Discuss physical and chemical mechanisms behind climate equilibrium, climate change, and human contributions**
- **Stimulate interests in seeking solutions to help mitigate climate change and improve adaptation**

Contents

Part 1:

- **Introduction**
- **Radiation (1-D)**
- **Thermodynamics (1-D)**
- **Climate equilibrium (1-D)**

Part 2:

- **Carbon cycle**
- **Climate-chemistry interactions**
- **Earth system modeling**

Scoring（成绩）

- In-class performance: 20%, including attendance, Q&A, quiz and discussion
- Homework (two sets): 20%
- Term project presentation (related to homework; no reviews): 20%
- Final exam: 40%

Individual requests to change scores are discouraged and will not succeed in general

Scoring

- 作业：两个部分分别出题，内容为简单模型试验，部分需要编程。

  可以跟教师、同学讨论，但必须独立设计试验、计算、作答。作业不一定有标准答案，重点是充分说明你的想法和推理依据。

- 报告：在学期末，每个同学自选其中一个主题的作业，开展延伸探索（非综述），并做简短报告。

作业、报告、考试如果发现有任何抄袭舞弊，将按校规处理

*** AI可作为辅助，但是必须自己完成，并写明AI的贡献，并符合校规 ***

References（参考文献）

- **Hartmann, D. L. Global Physical Climate. San Diego, CA: Academic Press, 1994, p. 408. ISBN: 9780123285300.**
- **Goody, R., Principles of Atmospheric Physics and Chemistry, Oxford University Press, New York, USA, 324 pp. ISBN: 0-19-509362-3**
- **Wunsch, C., Boyle, E., and Emanuel, K., Climate Physics and Chemistry.** (https://ocw.mit.edu/courses/12-842-climate-physics-and-chemistry-fall-2008/download/)
- **IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekci, R. Yu and B. Zhou (eds.)]. Cambridge University Press.** (https://www.ipcc.ch/report/ar6/wg1)
- **Seinfeld, J. H., and Pandis, S. N., Atmospheric Chemistry and Physics: from Air Pollution to Climate Change, 2nd edition, J. Wiley, New York, USA, 1232 pp. ISBN: 9780471720188**

Office Hour

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